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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/519,932

12/29/2004

Kazuaki Abe

28955.1043

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7590

10/30/2007

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EXAMINER

KHATRI, PRASHANT J

ART UNIT

PAPER NUMBER

4174

MAIL DATE

DELIVERY MODE

10/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/519,932 | ABE ET AL. | |
| | Examiner | Art Unit | |
| | Prashant J. Khatri | 4174 | |

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>5/02/2007, 7/18/2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, and 7-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Momose et al. (**EP 0412021**).

3. Applicants claim a heat-accumulative material that is a polymer or oligomer having a polyether main chain and a side chain. The side chains are capable of being crystallized.

a. Regarding claim 4, the above material has a melting point of -10°C to 100°C and a latent heat of at least 30 J/g. The material has a weight-average molecular weight of 1,000 to 2,000,000.

b. Regarding claims 7-17, applicants also claim a heat-accumulative composition comprising the above material and a synthetic resin chosen from a group.

Additionally, applicants claim different structures such as laminates, fibers, and mold articles made of the heat-accumulative material and the synthetic resin.

4. Momose et al. disclose a latent thermal energy storage material. The material comprises of a paraffin and a hydrocarbon organic high polymer. Examiner would like to note that paraffin is a group of alkane hydrocarbons.

- a. The paraffin serves as a storage material that has a latent heat of 30 kcal/kg, which when converted is an amount greater than applicants' minimum (**p. 3, lines 2+**). Prior art discloses the preferred paraffin as polyethylene glycol, stearic acid, and other fatty acids (**p. 3, lines 52+**).
 - b. The paraffin is combined with hydrocarbon organic high polymers such as polyethylene, thermoplastic elastomers, and hydrocarbon rubbers. Examiner would like to note that the group as claimed by applicants would be encompassed the hydrocarbons as listed by the prior art. Prior art discloses a T_{max} temperature at which a crystal transition occurs. Therefore, it is known that the paraffin wax is crystalline and would have an ordered structure with straight chains. Additionally, prior art discloses some applications that the storage material can be used for such as films, fibers, and molding processes (**p. 3, lines 39+**). Although the molecular weight of polyether material is not established, prior art discloses a transition temperature that is from room temperature to 100°C. It is known in the art that transition temperature is directly related to the molecular weight of the polymer. Therefore, the molecular weight and temperature as specified by the applicants would inherently fall within the range as disclosed by the prior art.
5. The phrases "energy-saving part", "building material", etc. are considered to be statements of intended use. The intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is

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capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Because the latent thermal energy storage material of Momose et al. is not structurally different from the heat-accumulative material as claimed by Applicants, the heat-accumulative material as claimed does not provide patentable distinction over the prior art of record.

6. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Tagoshi et al. (**US 5,395,895**).

7. Applicants claim a heat-accumulative material that has a polyether main chain and a side chain capable of crystallization. The main chain unit is a polyglycerol base or polyalkylene glycol base where each of the above has hydrocarbon groups attached to it. The hydrocarbon group is a straight-chain alkyl group.

8. Tagoshi et al. disclose a resin composition wherein an ethylenic copolymer is combined with a polyhydric alcohol, specifically a lauric acid monoester of decaglycerine (**Examples 23 and 30**). The lauric acid monoester of decaglycerine provides the molded article favorable heat stability properties. Examiner regards the favorable heat stability properties as being inclusive to the heat-accumulative properties as claimed by applicants. It is known in the art that straight chain hydrocarbon chains are crystallizable materials. Therefore, since the chains are straight alkyl hydrocarbons, it would be inherent that the lauric acid monoester would crystallize.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momose et al. (***EP 0412021***) in view of Tagoshi et al. (***US 5,395,895***).

11. Applicants claim the heat-accumulative material has a difference between the melting point and the solidifying point is at most of 15°C and has a 5 wt% loss temperature in the air measured by a TG-DTA.

12. Momose et al. disclose the above and the standard that was used to determine the transition temperatures. The standard can use a differential thermal analysis analyzer. Additionally, prior art discloses that the composition will melt at a temperature called Tmax and will solidify at a temperature lower than Tmax (***p. 3, lines 40+***).

Therefore, it would be obvious to one skilled in the art that the paraffin will be solid prior to the melting point. It is known in the art that crystallization depends on the rate of cooling and the order of polymer chains.

13. Tagoshi et al. teaches a lauric acid monoester of a decaglycerine used in a resin composition for molding along with the above prior art disclosures. Therefore, it would have been obvious to one skilled in the art that at that specific temperature, there would be a 5 wt% loss of material during a differential thermal analysis (DTA).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Anderson et al. (**US 4,487,856**).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prashant J. Khatri whose telephone number is (571) 270-3470. The examiner can normally be reached on M-F 7:30 A.M.-5:00 P.M. (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D. LAWRENCE TARAZANO
PRIMARY EXAMINER



Prashant J. Khatri
Examiner
Art Unit 4174